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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/571,500	03/10/2006	Mirko Milazar	2003P11268WOUS	4213
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EXAMINER SUNG, GERALD LUTHER				
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3746				
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07/18/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/571,500

Applicant(s)

MILAZAR, MIRKO

Examiner

GERALD L. SUNG

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-28 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 12-28 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 10 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claim 21 is objected to because the claim still contains spelling errors. The word "groove" is still misspelled as "grove" line 5. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 12-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Regarding claims 12-28, the limitation "wherein a width of the circumferential groove is smaller than a width of the spring element first end to provide a secure retention of the spring element in the circumferential groove" found in claims 1, 21 and 25 renders the claim indefinite because it is unclear as to exactly what the limitations are claiming. It appears that the applicant is trying to claim a limitation that recites an interference-fit or press-fit engagement between the seal and a circumferential groove, however as claimed, the limitation appears to indicate that the seals first end does not fit in the claimed circumferential groove. Furthermore, the drawings appear to indicate that an interference-fit or press-fit retains the seal in the circumferential groove.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States OR

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 12-15 and 18-28 are rejected under 35 U.S.C. 102(e) as being

anticipated by Morgan et al. USPN 6,464,457 B1.

7. Regarding claims 12, 15, 18-20, and 21-22, referring to figures 1 and 4 below, as best understood, Morgan et al. disclose a axis-symmetrical gas turbine engine, with a rotationally mounted rotor (22), an axial compressor (16), a combustor (18), a turbine (23), an annular casing (44) to carry the engine's core gas flow, where a front ring like portion (refer to figure 4) extending in the axial direction and a rear ring like portion (refer to figure 4) extending in the axial direction are mounted via a seal assembly (33). The seal assembly comprises of a spring element (56) to seal off an annular gap formed by the two pieces being joined together. The downstream end of the seal assembly is attached in a groove in the rear ring like structure and the upstream end attached to a groove in the front ring like structure. When joined together via a seal assembly (33), the two ring like structures form an annular gap extending in the direction of the engine's core gas flow. Further regarding the limitation "wherein a width of the recess is smaller than a width of the spring element first portion to provide a secure retention...", Morgan et al. disclose a seal first end in a circumferential groove that is retained in the groove by a bracket 78; however, referring to figure 4 below, the seal assembly's first end is in

Art Unit: 3746

contact with both walls, where the seal will be held in place, at least in part, by the friction generated from the contact of the seal assembly on the groove. It is therefore interpreted to mean that the width of the seal's first end is greater than the width of the circumferential groove.

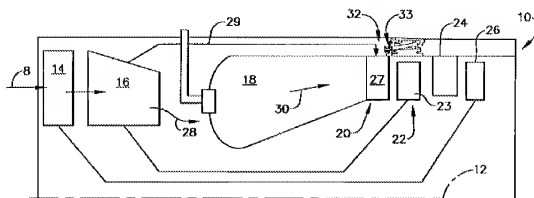


FIG. 1

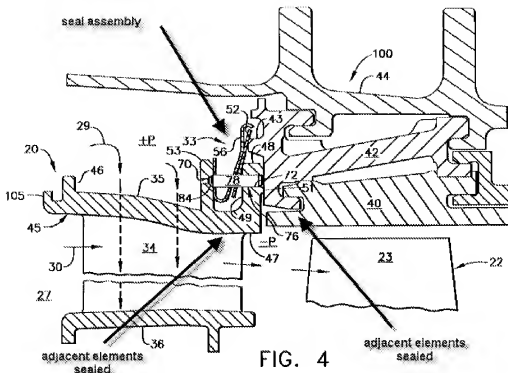


FIG. 4

8. Regarding claims 13-14, Morgan et al. disclose an inner portion of the casing assembly comprising support shrouds (42) that diverge conically in the direction of the flow. The front ring like structure comprises a structure resembling a radially inner collar and the rear ring like structure comprises a structure resembling a radially outer collar.
9. Regarding claims 18-20, 24, and 27, referring to figure 4 above, Morgan et al. disclose a seal assembly bearing surface is provided on the radially inner collar on the side opposite of the engine's core gas flow. The spring component of the seal assembly is of largely S-shaped cross section. Furthermore, the cooling medium exerts a higher pressure on the outer diameter surface of the spring assembly than the inner pressure as indicated in figure 4 via +/- P.

10. Regarding claims 21-22, referring to figure 4, Morgan et al. disclose a seal assembly (33) having a first structure with a collar portion, a second structure with a collar portion adjacent to the first structure and partially overlapping so as to form an annular gap, where the second structure has a circumferential groove open to the annular gap. The spring element of the seal assembly is arranged to seal the annular gap from the engine's core gas flow such that the seal assembly is arranged to be secured within the circumferential groove and the opposite end in the contact with the upstream ring like structure portion. The circumferential groove is facing the annular gap.

11. Regarding claims 23 and 26, Morgan et al. disclose the use of tack welds to fixedly join the seal assembly into an aft rail (column 2 lines 6-12).

12. Regarding claim 25, Morgan et al. disclose a seal system in a gas turbine engine comprising a first ring like structure concentric to the gas turbine centerline, a second ring like structure adjacent and concentric to the annular surface of the first ring like structure with a recessed surface, and a seal assembly arranged such that one end is within the recessed surface of the second ring like structure where the spring component of the seal assembly "[is] used to provide positive contact at the sealing surface when the pressure loading across the seal is low" (column 2 lines 18-20).

13. Regarding claim 28, Morgan et al. disclose a seal assembly that "... can accommodate differential radial movement between the aft rail (48) and the hanger (42)" (column 8 lines 36-39). Referring to figure 4 above, it can be seen that the assembly structure is capable of retaining proper sealing in the event of axial movement between the first and second ring like structures.

14. Claim 21 is rejected under 35 U.S.C. 102(b) as being anticipated by McLean USPN 6,431,825 B1.

15. Regarding claim 21, McLean discloses a seal between static turbine parts where a first component has a first collar 1 and a second component has a second collar 2, the first and second collar portions partially overlap to form an annular gap, the second component having a circumferential groove open to the annular gap, and an annular spring seal element arranged to seal the annular gap from a hot gas in the turbine having a first end, a second end and a spring region arranged between the first and second ends, the first end region secured within the circumferential groove and the second end in direct contact with the collar of the first inner casing ring capable of sealing the annular gap from a hot gas, wherein a width of the circumferential groove is smaller than a width of the spring seal element first end to provide a secure retention of the spring seal element in the circumferential groove.

16. Regarding claim 22, the grooves are facing the annular gap.

17. Regarding claim 24, the seal element has an S-shaped cross section, at least in part.

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 3746

19. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

20. Claims 12-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan et al. USPN 6,464,457 B1 in view of McLean USPN 6,431,824 B1.

21. Regarding claims 12, 15, 18-20, and 21-22, as best understood, referring to paragraphs 7-13 above, Morgan et al. disclose all elements of a gas turbine and/or seal assembly except an interference-fit or press-fit engagement between the seal first end and a circumferential groove such that the width of the circumferential groove is less than the width of the seal first end.

22. McLean teaches a seal between static turbine parts where the seal ends are force-fitted into a grooved slot. McLean explicitly discloses "[t]he resilient characteristic of the end pieces causes the latter to be snugly force-fitted against the surfaces of the grooves, resulting in a seal along the contact line between end pieces and grooves. The forced contact and seal are substantially independent from a pressure differential. The resilient characteristic furthermore has the result that, in the case of a shifting of the grooves relative to each other, the end pieces continue to rest against the grooves surfaces in a force-fitted manner along contact lines. As a result no spaces form between grooves and end pieces and a seal is ensured even in the static parts shift'

(column 2 lines 31-42). The forced-fit contact between the groove and the end pieces inherently means that the width of the seal end piece is greater than the width of the groove.

23. One of ordinary skill in the art at the time of the invention would have found it obvious to include a force-fitted engagement as taught by McLean as either the sole means of retaining the seal assembly disclosed by Morgan et al. or in conjunction with the current retaining mechanism disclosed by Morgan et al. in order to provide a seal contact in which no spaces form between grooves and end pieces and a seal is ensured through operation. Furthermore, one of ordinary skill in the art at the time of the invention would have further recognized that a forced-fitted seal engagement would have provided the same sealing function or at least one comparable to the sealing engagement disclosed by Morgan et al. while at the same time providing an ease of manufacturing and assembly.

24. Regarding claim 16, as best understood, Morgan et al. disclose all elements except a circumferential groove with a radial thickness which is less than twice the material thickness of the spring seal; however, it would have been obvious to one of ordinary skill in the art at the time of the invention, since Morgan et al. disclose the "leaf spring (56) is a generally partially folded member with a U-configuration for being trapped and placed in compression between the tab (53) and the leaf seal (52)" (column 8 lines 5-10), that the thickness of the seal in relation to the circumferential groove is merely a design choice where the optimization of the seal assembly is dependent on the thickness of the seal as well as the width of the groove. Therefore,

the limitations of claim 16 do not lend itself to be patentably distinguishable over the prior art. One of ordinary skill in the art at the time of the invention would have recognized that the tighter the engagement between the seal end piece and the circumferential groove, the more effective the press-fitted engagement would be.

25. Regarding claim 17, Morgan et al. disclose a first end of the spring element connected to a groove via tack welds.

26. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan et al. USPN 6,464,457 B1.

27. Regarding claim 16, as best understood, Morgan et al. disclose all elements except a circumferential groove with a radial thickness which is less than twice the material thickness of the spring seal; however, it would have been obvious to one of ordinary skill in the art at the time of the invention, since Morgan et al. disclose the "leaf spring (56) is a generally partially folded member with a U-configuration for being trapped and placed in compression between the tab (53) and the leaf seal (52)" (column 8 lines 5-10), that the thickness of the seal in relation to the circumferential groove is merely a design choice where the optimization of the seal assembly is dependent on the thickness of the seal as well as the width of the groove. Therefore, the limitations of claim 16 do not lend itself to be patentably distinguishable over the prior art.

28. Regarding claim 17, Morgan et al. disclose a first end of the spring element connected to a groove via tack welds.

Response to Arguments

29. Regarding the applicant's argument that Morgan et al. teaches a leaf seal assembly 33 comprised of a leaf seal 52 and a leaf spring 56 that must be secured by a mounting pin 78 in order for the leaf seal assembly to function, the examiner respectfully asserts that although the intended mounting assembly must include a mounting pin 78, the claimed limitations do not require that the seal assembly be held solely by an interference-fitted engagement. Furthermore as cited above, Morgan et al. teach a U-shaped (at times an S-shaped) configuration for trapping and placing the leaf seal in compression between the tab 53 and the leaf seal 52. This inherently means that there is a forceful engagement between the seal end piece and the groove. This being the case, the seal assembly end piece would have a greater width than the circumferential groove when the seal assembly is in an uncompressed state.

30. The arguments are also moot in view of a new ground of rejection necessitated by amendment.

Conclusion

31. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

32. Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERALD L. SUNG whose telephone number is (571)270-3765. The examiner can normally be reached on M-F 9am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art
Unit 3746

Art Unit: 3746

Gerald Sung
Patent Examiner
GS
15 July 2008